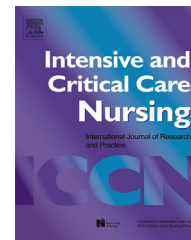




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REVIEW

Nurses perceptions of sleep in the intensive care unit environment: A literature review



Laura Nesbitt^a, Debbie Goode^{b,*}

^a Staff Nurse, Northern Ireland

^b University of Ulster, Northern Ireland

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KEYWORDS

Sleep deprivation;
Intensive care;
Nurses' perceptions

Summary

Objectives: Sleep deprivation within intensive care units (ICU) remains a recurring norm despite the extensive research highlighting a crucial need for sleep promotion. However, the degree to which sleep deprivation can be associated with the nurses' provision of care remains unclear. Therefore, this critical literature review aims to explore the nurses' knowledge and prioritisation of sleep whilst examining the nurses' use of sleep assessment skills and tools. The nurses' awareness and prioritisation of sleep promoting interventions and complimentary therapies will also be analysed.

Methods: The online databases Cochrane, CINAHL and Science Direct were searched for English language articles, published between 2003 and 2013 which were downloadable in full text format. A total of 378 articles were identified and 25 papers met all the inclusion criteria.

Conclusions: It appears that ICU nurses lack a complex understanding of the importance of sleep and the interventions needed to promote it. Indeed, studies suggest that inattention to sufficient training and a lack of structured protocol within practice makes the provision of sleep for the ICU patient impossible. Therefore, whilst further empirical research is required it may be noted that evidence informed education programmes and sleep assessment tools require development within the ICU environment.

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Implications for nurse practice/education

- ICU nurses must be supported with specialist education programmes to develop their knowledge and understanding of the importance of sleep.
- Specific, standardised sleep assessment tools should be introduced in all ICU environments to aid an accurate determination of patient sleep by the nurse.

* Corresponding author. Tel.: +44 2871675219.

E-mail address: D.Goode@ulster.ac.uk (D. Goode).

Implications for research

- More research is needed in order to establish an effective assessment tool which can be used to monitor patient sleep in the ICU environment.
- More research is needed to establish areas in which nurses lack knowledge and experience to enable the design of effective sleep education programmes.

Introduction

Sleep is an active, crucial process thus when a critically ill patient is deprived by a reduced total sleep time not only is their healing process at detriment but indeed their entire survival (Frieze et al., 2007). Sleep deprivation has been recognised as a recurring complication emanating from ICU practices. Significantly, Granja et al. (2004) suggests that the critical care nurses routine and necessity for frequent assessment and intervention positions this multidisciplinary team member most at risk of impacting upon the critically ill patient's ability to sleep.

Therefore, this literature review aims to explore nurses' perceptions of sleep within the ICU environment. Specifically the work aims to highlight:

- the nurses' knowledge and prioritisation of sleep;
- the nurses' understanding and use of sleep assessment skills and tools;
- the effects of nursing interventions upon the sleep experience;
- the implementation of acupuncture as a complimentary therapy to aid sleep.

Methods

A search for literature was performed using the online databases Cochrane, CINAHL and Science Direct. The following key words were used: critical care nursing, ICU nurse, intensive care unit, sleep, sleep deprivation, sleep assessment, sleep promotion, sleep facilitation, non-pharmacological interventions and clinical development. Inclusion criteria were: (1) available in English, (2) downloadable in full text format and (3) published between 2003 and 2013. Citation tracking as well as manual searching online, within the library and review of government papers also supplemented this electronic investigation. Therefore, other highly relevant pieces of older research have also been included, where appropriate, to gain historical insight.

Results

Of the 378 articles initially identified, 25 were found to meet all of the inclusion criteria (Fig. 1). The majority were nursing surveys (24%), followed by observational studies (20%), systematic reviews (12%), narrative reviews (12%), literature reviews (8%), randomised controlled trials (8%), quasi-experimental studies (8%), cohort studies (4%) and professional documents (4%).

The themes which follow initially aim to establish grounding for this discussion exploring what patients' experiences

of sleep are within the ICU environment as well as a presentation of the evidence surrounding the physical and psychological effects of sleep deprivation. This review then attempts to establish nurses' perceptions of patient sleep. Is the high incidence of sleep deprivation associated with nurses' knowledge of sleep physiology or their ability to assess patient sleep? What interventions are nurses' implementing to promote sleep? What is their awareness of complimentary therapies which can be used to aid the sleep process? It is hoped that this critical examination will not only establish areas in need of further empirical research but will also uncover aspects of nursing care which require clinical development in order that the sleep experience for the ICU patient may be improved.

Discussion

Patients' experiences of sleep in ICU

Over the last three decades it has been continually reported that ICU patients endure a severe loss of sleep. Indeed, Simnini (1999) uncovered that among the 72 responding patients, 61% reported sleep deprivation. Additionally, Franck et al. (2011) explored the memorisation of sleep disturbances during an ICU stay. The telephone interview studied a random sample of 60 admitted ICU patients 6–12 months following their discharge. Among the high response rate of 53 (88%), sleep disturbances were described by half.

However, findings from Eithier et al.'s (2011) study uncover possible limitations in Franck et al.'s (2011) methods. Eithier et al. (2011) administered a questionnaire to 21 patients, three days following their ICU discharge. All patients had been managed with a sedation protocol. The questionnaire was designed to satisfy the study's specific goals. Whilst the face and content validity of the questionnaire was formally assessed, it was not tested for recall or instrumentation bias. Despite these limitations 48% of patients reported no memory of endotracheal suctioning, 33% reported no memory of being on a "breathing machine," and 29% reported no memory of being bathed. These statistics highlight that Franck et al.'s (2011) reliance upon patients' ability to subjectively recall events from their ICU stay may have produced findings with limited trustworthiness.

Notably, Frieze et al.'s (2007) objective measurement produces a more established level of evidence. A certified sleep technician monitored and scored 16 surgical ICU patients sleep, using polysomnography, over a 24 hour period. Findings suggest patients do achieve measurable sleep whilst cared for in the ICU setting. However, it is extensively fragmented, with a significant reduction in the

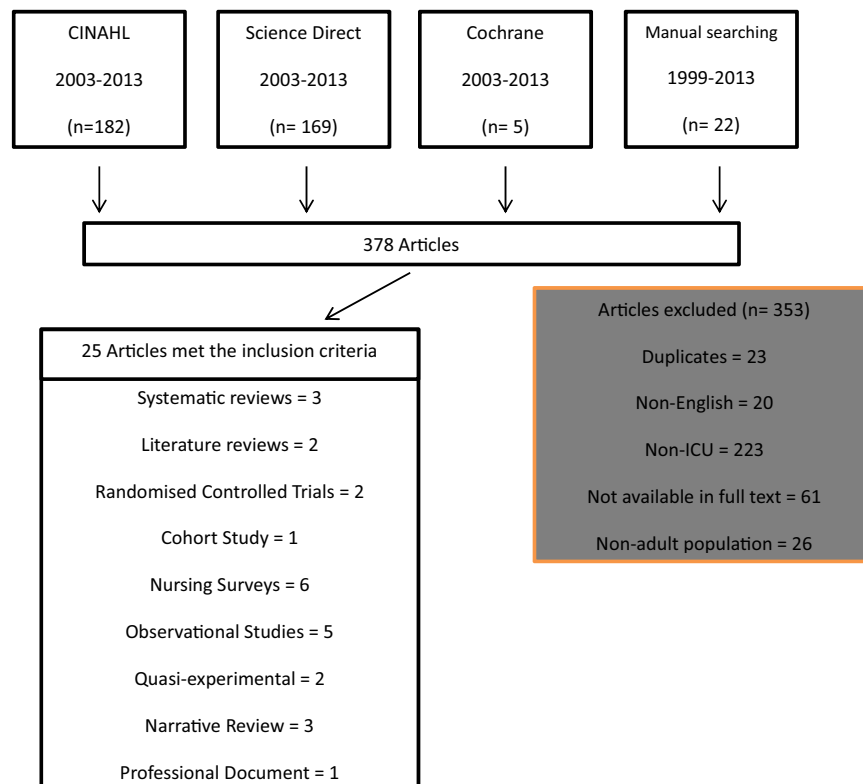


Figure 1 Search strategy.

proportion of time spent in the deeper more restorative stages. Whilst more credible, generalisability to the entire ICU population is limited as only 16 patients were studied. Thus, the heterogeneity of research findings appears to compound a difficulty in establishing a single conclusion with respect to patients' experiences of sleep in ICU.

Physical and psychological effects of sleep deprivation

Of importance, research, such as that presented by [Zhong et al. \(2005\)](#) raises a number of issues regarding the physical and psychological effects of sleep disruption. Indeed, this randomised controlled trial suggests an association between the incidence of sleep deprivation and adverse cardiovascular disorders. The study monitored 21 patients using polysomnography as well as continual heart rate and blood pressure recording. After only 36 hours of sleep deprivation patients presented endothelial disruptions associated with hypertension and coronary artery disease. However, the sample focused upon young, healthy, American subjects with no acute or chronic medical disorders. Therefore, application of findings to the ICU patient is limited.

Furthermore, [Weinhouse and Schwab \(2006\)](#) conducted a systematic review of 26 studies. The researchers attempted to demonstrate similarities between clinical and physiological profiles of patients with delirium and sleep deprivation within ICU. Upon review of available research the study concluded that, although unproven, sleep deprivation may play an important role in the pathogenesis of delirium. As in [Zhong et al. \(2005\)](#) research only healthy volunteers

were studied, limiting application of findings. Therefore, the lack of available randomised controlled trials studying the association of sleep disruption and delirium allows no cause and effect relationship to be robustly proven.

Nurses' knowledge and prioritisation of sleep in ICU

[So and Chan \(2003\)](#) and [McIntosh and MacMillan \(2009\)](#) argue that a lack of available evidence contributes to the nurses deficiencies in sleep prioritisation. [So and Chan \(2003\)](#) conducted a comparative descriptive study in two major hospitals in Hong Kong and found strong differences in the perceptions of stressors. Whilst patients ranked not being able to sleep as the third most stressful factor of ICU stay, nurses identified it as being tenth. However, the small sample in the patient group ($n = 50$) can be identified as a major limitation when compared to the high response rate of 83.6% ($n = 92$) from ICU nurses. Furthermore, use of a convenience sampling method may limit generalisation of findings to a broader population of critical care patients.

[McIntosh and MacMillan \(2009\)](#) distributed questionnaires to 120 student nurses undertaking hospital placements within England. Results found that student nurses lacked a comprehensive understanding of sleep physiology. Even more surprisingly, only one student had encountered a structured protocol or model for assessing sleep. Notably, generalisability is increased as a sample of students were chosen using four different education institutions. However, the voluntary nature of students for participation in the study does not allow for generalisations to be made in relation to the whole population of students in the

United Kingdom. It may be that the volunteers were more knowledgeable in sleep and its promotion and thus were more interested in being involved in the research. Nevertheless, both studies make similar recommendations; nursing education programmes and ICU introductory courses must be reviewed in order that nurses are educated to recognise the importance of sleep.

Nurses' assessment of patient sleep

McIntosh and MacMillan (2009) argue there is a scarcity of structured models for assessing sleep. However, Frisk and Nordstrom (2003) utilised the Richard Campbell Sleep Questionnaire to gather data about patients' perceptions of sleep, as well as the nurses' assessment ability. Results found no significant difference between the 31 patients' and 31 nurses' perceptions of sleep. Therefore, valid tools are available allowing nurses to assess the sleep of patients who are unable to report for themselves. The questionnaire appears valid as it was designed for use with the ICU patient; however caution must be taken when interpreting findings. Use of self-report instruments requires the ICU patient to possess significant cognitive ability. However, due to patient immobility or inability to speak, the researchers may have introduced some observer bias when obtaining the patients perspective.

Beecroft et al. (2008) conducted an observational study that compared the accuracy of nursing sleep assessment to that of overnight polysomnography. The findings suggested that nurses overestimated sleep time, sleep efficiency and the number of patient awakenings. This study strongly argues that nurses lack the tools, knowledge and skills to accurately assess the ICU patients sleep. However, caution must be taken as the use of polysomnography is not without limitations. The electrodes and recording equipment can have a disruptive effect on patient sleep, introducing another potential environmental disruption (Fanfulla et al., 2011). Furthermore, there is no available evidence establishing the extent to which ICU nurses utilise sleep assessment in the absence of a researcher.

The effects of nursing interventions upon the patient sleep experience

Tembo and Parker's (2009) systematic review identified factors consistently reported as contributing to sleep disturbance in ICU. Altogether, 22 articles were critiqued, 8 literature reviews, 5 qualitative and 9 quantitative studies. Conclusions suggested that sleep disruption is most likely caused by a combination of intrinsic and extrinsic factors. Environmental and intrinsic factors as well as nursing interactions were specifically discussed as major components of sleep disruption. Environmentally, noise was cited as the most common cause of sleep deprivation in ICU. Ideally, the World Health Organisation (1999) recommends that sound levels in patient rooms should not exceed 35 decibels (dB). Unfortunately, when Johansson et al. (2012) placed a sound recorder at 13 ICU patients' besides, maximum sound levels were found to exceed 55 dB, 70–90% of the time.

What is more, Olsen et al. (2001) suggest nursing interventions lead to the high levels of sleep disruption observed

in ICU. In all, 239 participants were included, 118 in the control group and 121 in the intervention group. Within the intervention group two 2-hour rest periods with no nursing interaction were introduced. Results found that patients in the intervention group had more sleep than those in the control group. Whilst this observational study is likely to be more focused on the quantity rather than the quality of sleep it can be concluded that a reduction in nursing interactions is positively associated with sleep promotion.

Friese et al. (2012) conducted an observational cohort study of 200 ICU patients over 51 separate nocturnal time periods. During this 7-month study nurses caring for these patients completed a questionnaire. They recorded the number, approximate length of time and type of nocturnal nursing interaction which took place between 2200 and 0600 hours. Whilst 1831 nocturnal interventions were identified, nurses estimated that 13.9% of these could be safely omitted. However, following the study, nursing staff stated they lacked time to accurately document every patient interaction which occurred. Therefore, the trustworthiness of findings may be questioned. Nevertheless, this study suggests that whilst nurses appear to recognise the need to change practice, they may well have become desensitised to the constant chaos of the ICU. Furthermore, Christensen (2005) argues that nurses lack understanding of the sleep promoting interventions they should be implementing. The multiple choice questionnaire found that less than 5% of questions asked, relating to sleep facilitation, were answered correctly. However, generalisations to other hospitals and ICU settings cannot be made. This study was only conducted in one Bournemouth hospital using a small sample of 96 nursing staff.

Hofhuis et al. (2012) conducted an exploratory survey which revealed that 83.8% of ICU in the Netherlands have no formal sleep protocol in place. However, 67.6% of nurses suggested the implementation of such a strategy would be highly welcomed. Therefore, a lack of guidance pertaining to sleep promoting interventions can clearly be seen as the majority of ICU nurses in this study argued the need for further training and clinical development.

Indeed, nurses must adapt interventions to promote the sleeping environment. Interestingly, Scotto et al.'s (2009) quasi-experimental study found sleep satisfaction scores were significantly improved for the 50 patients utilising ear plugs within the intervention group. In contrast, of the 64 patients who completed Richardson et al.'s (2007) sleep assessment rating scale only 34 found earplugs to have improved their sleep. This would suggest that ear plugs do not block out the high levels of noise experienced by the ICU patient. Therefore, in the absence of randomised controlled trials neither study can prove the effectiveness of this intervention.

Acupuncture as a complimentary therapy to aid sleep

What is more, several studies have attempted to identify a positive link between complimentary therapies and sleep promotion. Whilst an extensive variety of complimentary therapies exist acupuncture has been focused upon, as unlike other treatments, strong empirical evidence

surrounding this practice is available. Indeed, Cheuk et al. (2012) conducted a systematic review of 33 randomised controlled trials, evaluating the use of acupuncture for insomnia. According to traditional Chinese medicine acupuncture is employed to apply gentle pressure to specific acupoints throughout the body, stimulating a 'flow of life energy' to prevent/treat sleep disorders (Sun et al., 2005). Cheuk et al.'s (2012) review concluded that compared to no treatment, acupuncture was beneficial. Indeed, Chen et al.'s (2011) randomised controlled trial found that when acupuncture was administered as a regular treatment to an experimental group, patients sleeping hours increased. Therefore, due to the robustness associated with Cheuk et al. (2012) and Chen et al. (2011) studies it can be suggested that some forms of complimentary therapy can be used to promote sleep.

Nursing knowledge and practice in relation to complimentary therapies

However, Cooke et al. (2011) studied 385 ICU nurses in Australia, establishing their knowledge and practices in relation to use of complementary therapies. Interestingly, the questionnaire found that inadequate staff training (91.8%) and lack of knowledge (89.8%) were identified by the vast majority of nurses as barriers experienced in the Scholar's use of these therapies. Therefore, another area in need of clinical development is identified. However, once again generalisations of this Australian study cannot be made and further research needs to occur into the use of complimentary therapies within ICU.

Conclusion

This investigation suggests that on average the sleep experience of the ICU patient is sub-optimal. What is even more shocking is that ineffective sleep appears to have detrimental physical and psychological effects upon the patient. Yet, it seems that ICU nurses fail to prioritise patient sleep. Indeed, this may be associated with findings which uncover that nurses do not have a comprehensive understanding of sleep physiology/assessment nor the interventions needed to promote sleep, including complimentary therapies. Therefore, a paradigm shift in nursing practice must occur.

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